GMS-Petrasim-TOUGH2

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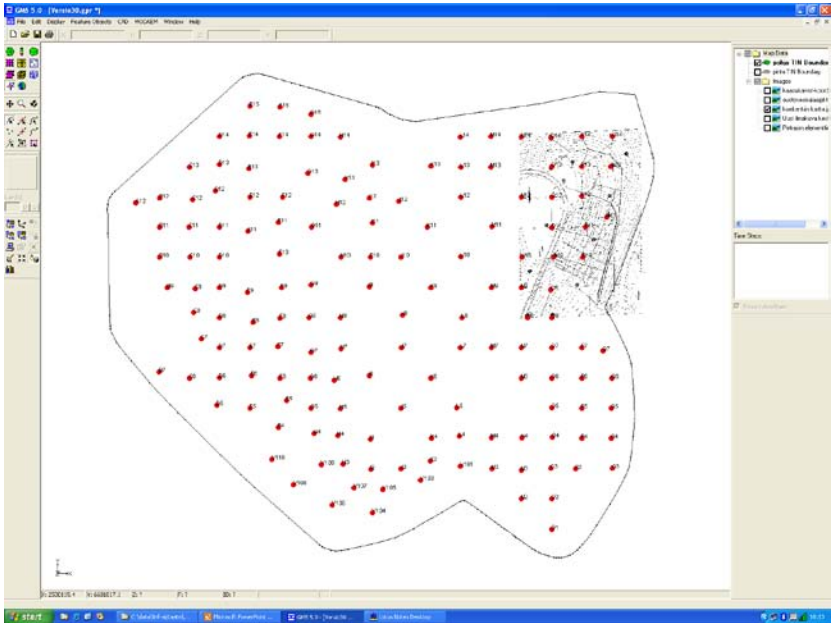
GMS
Groundwater Modeling System

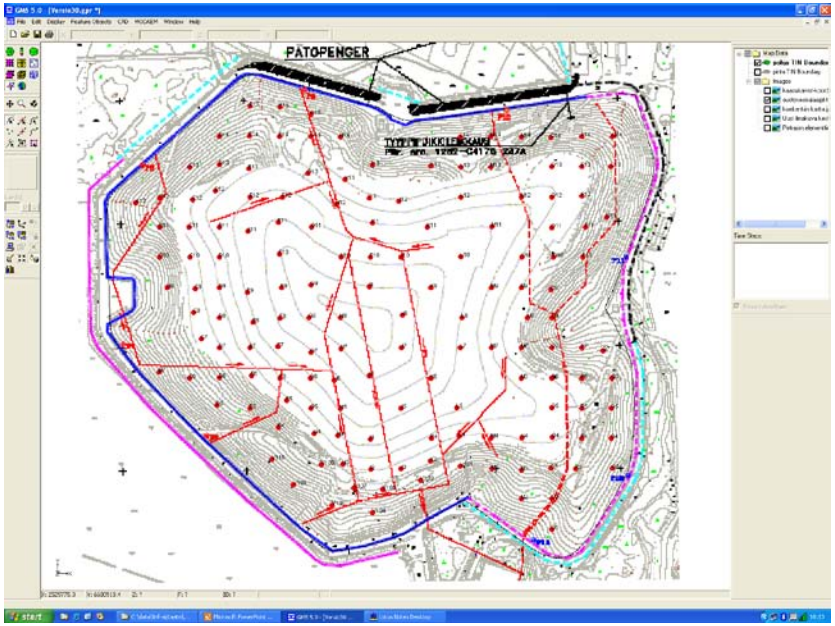
- Reads scattered data from *.txt –files
  - 2D: x, y, data1, data2, data3,…
  - 3D: x, y, z, data1, data2, data3,…
- Can be used to
  - create surfaces from scattered 2D-data
  - create layers and solids from surfaces
  - create cross-sections of solids
  - create grids around the 3D-data
  - interpolate to surfaces, cross-sections or grids
  - store figures, that are binded with the data through the coordinates
  - read CAD-files

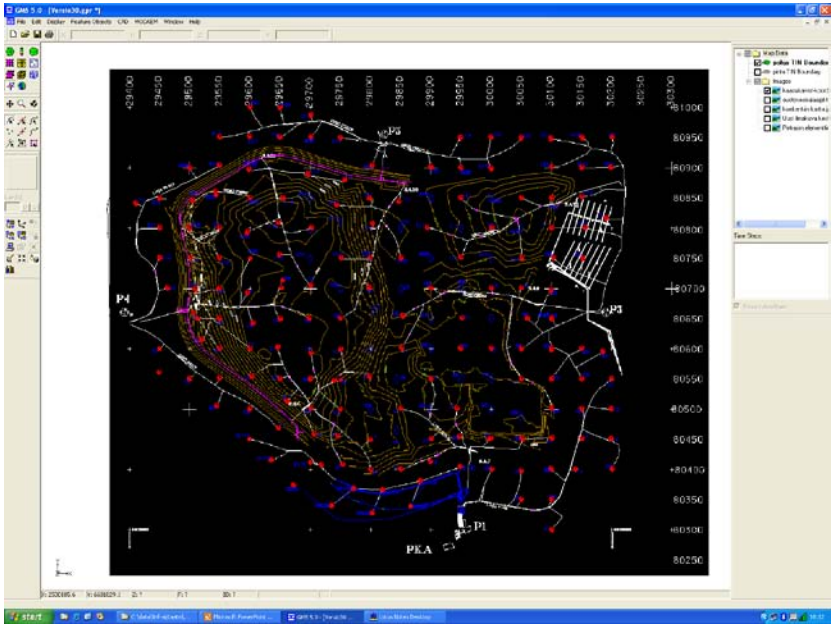
Petrasim
Pre/postprocessor for TOUGH2

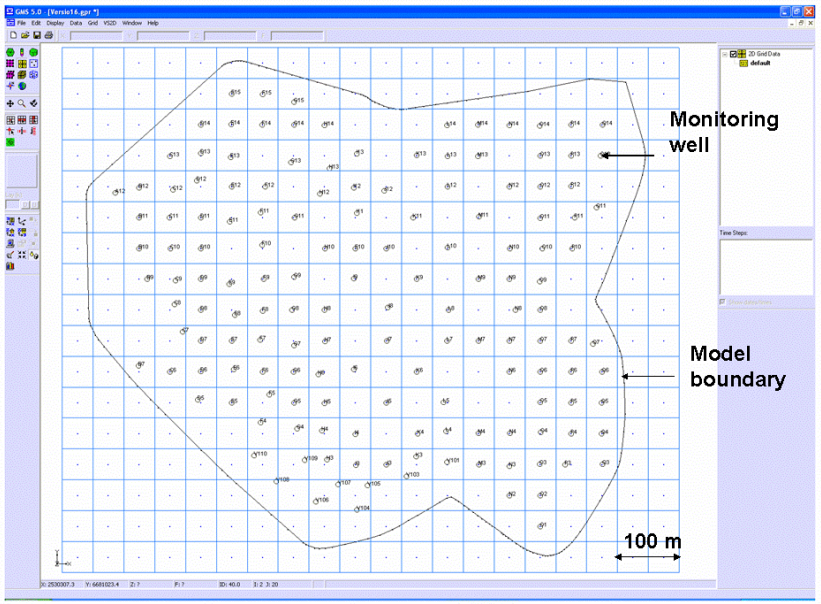
- Can be used to
  - interactively create TOUGH2-models
  - write TOUGH2 input files
  - run simulations
  - visualize the results
- Special:
  - The real coordinates can be given to the grid and they will be written to the TOUGH2 input file
  - Materials and properties can be given to the elements layer by layer, element by element
  - Gridlines can be deteleted or added according to the need
- Special2:
  - During the simulation Petrasim writes all the TOUGH2 files

GMS

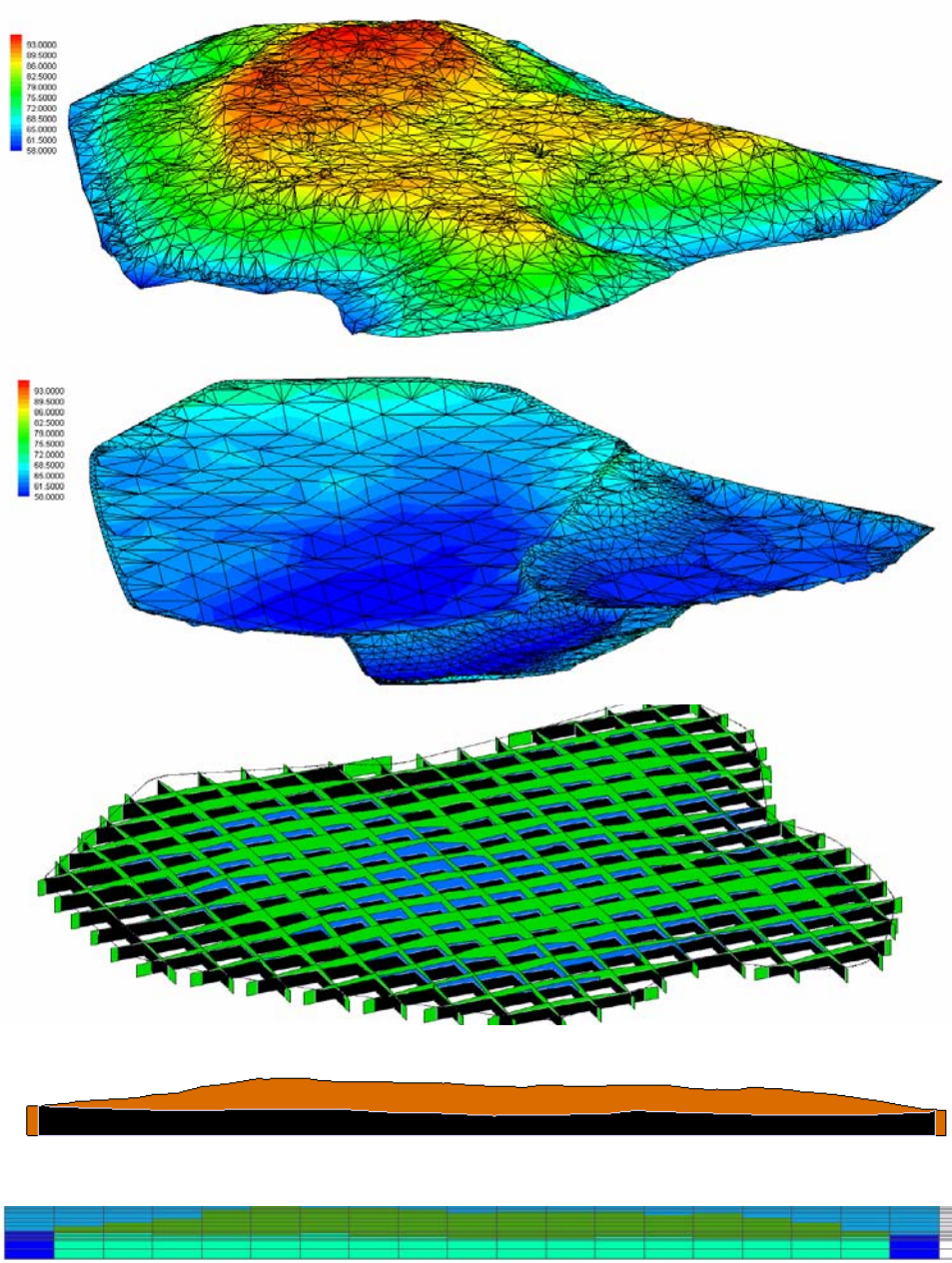


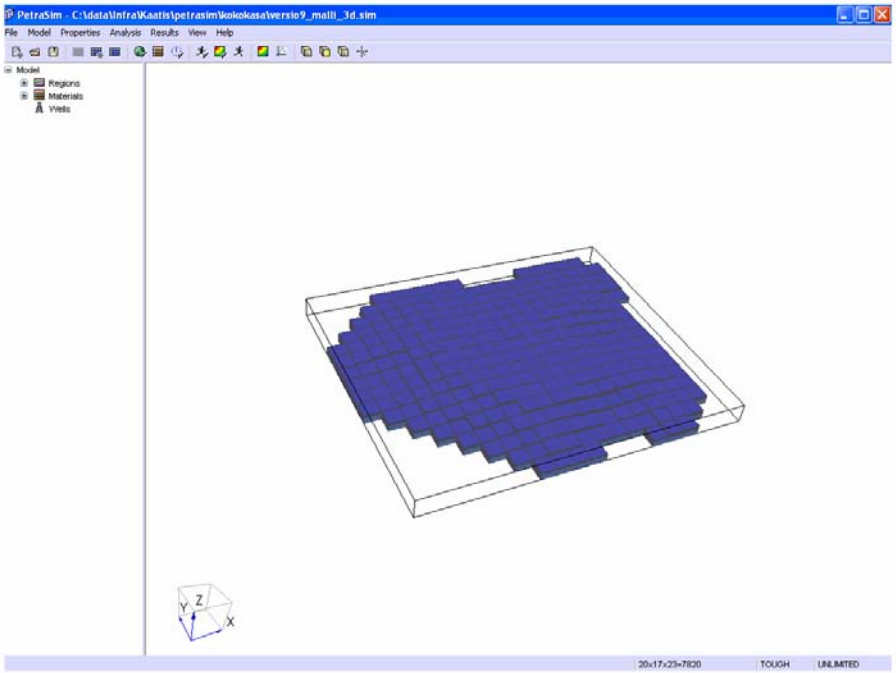

PATOPENGER

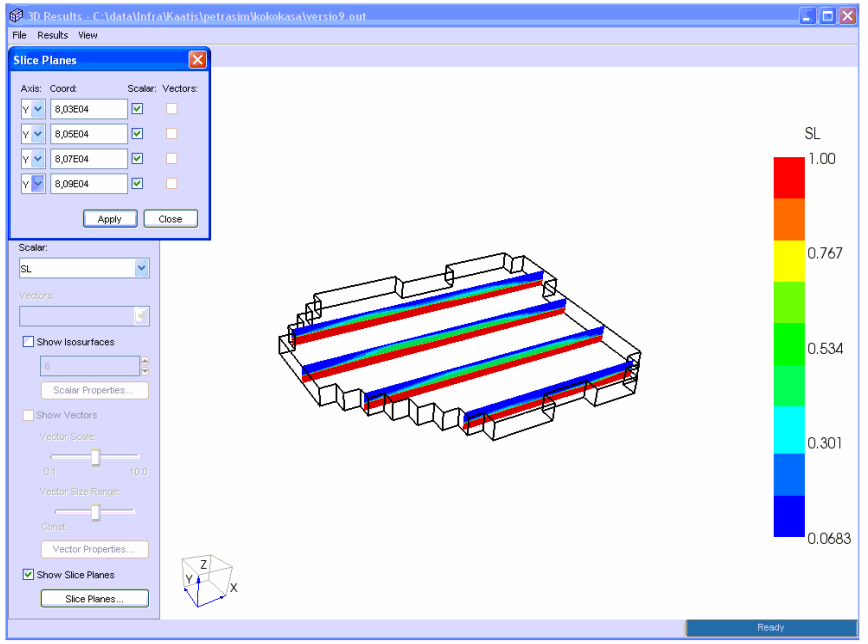

P4
P3
P1
PKA


Monitoring well
Model boundary
100 m

GMS → Petrasim → Tough2







Procedure

- Create a 3D model about the system with GMS
- Draw a grid in GMS around the problem area
- Create the Petrasim-model interactively by using the same coordinate system as in the GMS-model
- Run the simulation with Petrasim
- Look at the results in Petrsim
- Make changes to the model if needed
- Write a short Fortran-code that
  - reads the node coordinates from the TOUGH2 input file
  - reads the simulation results from the TOUGH2 output file
  - writes the results to a file in the form x, y, z, data1, data2,...
- Read the results to the GMS
- Use GMS geostatistical tools to analyze the results